The Effects of Writing Strategy Training on Lexical Density and Linguistic Quality in Grade 11 Students' Writing

ⓘⅅ Lalisa Leta[1], Tekle Ferede[2] & Teshale Tefera[3]

[1]Department of English Language and Literature, Dilla University, Ethiopia
[2]Department of English Language and Literature, Jimma University, Ethiopia
[3]Department of English Language and Literature, Wollega University, Ethiopia

Abstract	Article Information
The study examined the effects of writing strategy training on Grade 11 students' lexical density, linguistic quality, and perception of writing skills in secondary school EFL writing. A quasi-experimental design was employed with 99 grade 11 students from Ambo Awaro High School. Intact classes were randomly assigned to experimental and control groups. The researcher gathered data via paragraph-writing tests and semi-structured interviews. Paired and independent samples t-tests were used to analyze quantitative data, while interview data were thematically analyzed. The findings of this study revealed that the participants in both the experimental and the control groups were similar in using lexical density and linguistic quality in the pre-test stage. However, in the post-test, the experimental group showed substantial improvements, whereas the control group showed no significant changes in their lexical density or linguistic quality. The interview results supported the changes gained by the experimental group by showing enhanced vocabulary awareness, improved paragraph organization, monitoring of grammar, and greater confidence. In conclusion, the results of this study confirm that the strategy training improves linguistic richness and writing quality. Therefore, it is recommended that a strategy-based learning approach be applied to regular EFL writing.	 *Corresponding Author: Lalisa Leta (PhD Candidate) E-mail: lalisaleta@gmail.com

INTRODUCTION

Writing is one of the most mentally challenging skills in second and foreign language learning, which demands students to generate main ideas, organize them logically, and use language structures correctly and meaningfully. Despite the essential indicators of advanced writing development in lexical density and linguistic quality, students' written texts often involve limited lexical richness, low cohesion, and persistent grammatical inaccuracies in many EFL contexts (Abebe, 2023). Furthermore, according to Namaziandost et al. (2022) and Fenta (2024), EFL learners frequently write texts with low lexical density because of their restricted vocabulary and usage of basic structures. Lexical density represents the percentage of content words in a text and quantifies the amount of information a writer conveys (Biber et al., 2021).

In the context of the students' written products, linguistic quality refers to the overall

effectiveness, accuracy, and clarity with which language is used to convey meaning. It includes several vocabulary ranges and appropriateness, grammatical accuracy, sentence structure and complexity, cohesion and coherence, and punctuation and spelling. High linguistic quality indicates that a learner can produce text that is not only error-free but also sophisticated, coherent, and lexically rich, reflecting advanced control of language required for academic writing. However, learners have underdeveloped linguistic quality, a broader construct that includes vocabulary range, grammatical accuracy, sentence complexity, coherence, and mechanics (Teng, 2022; Zhang & Liu, 2023). Writing strategy training can enhance these linguistic dimensions by promoting idea generation, vocabulary expansion, and metacognitive regulation while writing, as suggested by Teng and Zhang (2021) and Rahimi and Zhang (2023).

Statement of the Problem

Grade 11 EFL students commonly produce paragraphs with low lexical density; their writing contains few content words and relies heavily on simple and repetitive vocabulary, which limits the richness of information conveyed. They also produce a weak vocabulary range, grammatical errors, poor sentence structure, limited cohesion, and unclear organization. These lead to texts with less precise, incoherent, and linguistically underdeveloped content, a problem widely reported in secondary school EFL contexts (Abebe, 2023).

Despite the strong theoretical foundation of strategy-based writing training, there remains a clear difference between theory and actual classroom practice in grade 11 at Ambo, Awaro Secondary School. The majority of writing instruction still focuses on lower-order features of writing, which focus on the illumination of linguistic errors and pay little attention to the cognitive, metacognitive, and vocabulary-related methods that support deeper linguistic growth (Abate, 2022; Dinsa, 2023).

Most international research focuses on the effects of general strategy training in writing performance (Chen, 2022), particularly focused on general performance scores and grammatical accuracy, but fewer studies have examined deeper linguistic constructs like lexical density and linguistic quality at the secondary school level. Locally, Tasisa and Tadesse (2024) used descriptive studies to explore the interplay between writing strategies, self-efficacy, and performance, but they did not investigate how explicit strategy instruction influences deeper linguistic features. Then, this study utilized a quasi-experimental design with mixed methods, casting light on the mechanisms by which writing strategy training affects both linguistic results and learner perceptions. In addition, the classroom instruction of writing often remains traditional and rarely integrates cognitive and metacognitive strategies in the high school context. Therefore, this gap highlights the need for this study, which explains learners' experiences with strategy training, which contributes to its scientific originality. Therefore, this study attempted to investigate the gaps by examining how writing strategy training improves the lexical density and linguistic quality in the students' written texts, and their perceptions of strategy use by combining statistical analysis with qualitative insights, and attempt to answer the research questions below.

Research Questions

1. To what extent does writing strategy training improve the lexical density of Grade 11 students' written paragraphs?
2. How does writing strategy training influence the linguistic quality of Grade 11 students' written paragraphs?
3. How do Grade 11 students perceive the influence of strategy training on their vocabulary use and writing quality?

MATERIALS AND METHODS
Research Design and Paradigm

This study employed a quasi-experimental design incorporating a pre-test and post-test with

experimental and control groups. Such a design is appropriate for investigating causal effects in naturally existing classroom settings (Creswell & Creswell, 2018). The intervention group received systematic writing strategy training, while the control group continued with conventional writing instruction. Writing strategy instruction was adopted because it enables learners to engage in recursive writing processes, planning, drafting, revising, and editing, which is known to enhance writing outcomes in EFL contexts (Chen, 2022; Ayadi, 2025). Similar quasi-experimental approaches have effectively revealed improvements in learners' writing complexity and lexical development (Tömen & Köse, 2023).

Sampling and Population

The participants of this study consisted of 99 Grade 11 students enrolled at Ambo Awaro High School. The school was purposively selected because of its proximity to the researcher and accessibility of the required data. In addition, grade 11 students were also purposively selected due to the researcher's long teaching experiences. Specifically, two intact classes were used as the sampling units using the lottery sampling technique. To ensure comparability between groups, the two classes were assigned randomly to the experimental and control groups to confirm fairness and reduce potential bias in group allocation.

Data Collection Instruments

A paragraph writing test was used as a primary instrument that was administered at pre- and post-tests for measuring the lexical density and overall linguistic quality in the students' written texts. Students were required to write a paragraph with about 200 words on a similar topic sentence under controlled classroom conditions to ensure consistent administration. An analytic scoring rubric was adapted from Al-Ghazo and Ta'amneh (2021) to score the paragraph. The rubric contains content, vocabulary, grammar, structure, and mechanics rated on a four-point scale, 1 = poor to 4 = excellent. Chen (2022) stated that rubric-based

scoring is broadly known as a reliable means to assess writing quality. To enrich scoring consistency, two independent trained raters measured all texts using the same rubric tool. The agreements of the raters were examined using Cohen's kappa, which yielded 0.70, indicating a significant level of agreement between the raters and confirming the reliability of the scoring procedure.

To complement the quantitative data, a semi-structured interview was used. Confirming this, Creswell and Creswell (2018) also explain that a semi-structured interview balances the consistency across the participants with freedom to navigate ideas in depth. Accordingly, this interview was conducted with ten participants selected from the experimental group to get insights into their beliefs about the strategy training and writing it to support the quantitative findings.

The Experiment Procedures

Prior to the intervention, both control and experimental groups received a pre-test to determine baseline equivalence in linguistic quality and lexical density. The experimental group then received eight weeks of strategy training that focused on cognitive, metacognitive, memory, compensation, affective, and social strategies. As Chen (2022) and Ayadi (2025) have supported, instruction followed a process-oriented writing, emphasizing meta-cognitive awareness and vocabulary expansion techniques. Based on this, the control group continued with their usual instruction without the training. After the treatment was over, both groups took a post-test under similar conditions. This stepwise approach confirmed the comparability of pre- and post-intervention performance (Tömen & Köse, 2023).

Methods of Data Analysis

The lexical density of students' written paragraphs was calculated using the formula in which lexical density equals the number of lexical items divided by the total number of token words and multiplied by 100. Identification of lexical items and token counts was conducted manually to ensure a precise

distinction between content and function words. After computing lexical density values, independent-samples t-tests were used to examine the differences between the experimental and control groups. The paired-samples t-tests were employed to examine the changes that occurred at both the pre- and post-tests within each group. The same statistical procedures were applied to the rubric-based writing scores in order to evaluate improvements in overall linguistic quality attributable to the intervention. In addition to the quantitative measures, the interview data were analyzed thematically following a systematic coding process, which involved grouping them into broader themes and interpreting how these themes explained students' perceptions of the

strategy training. This statistical analysis enabled the researcher to understand learners' subjective experiences.

RESULTS AND DISCUSSIONS
Results

Lexical density measures linguistic features to quantify the proportion of content words, such as nouns, verbs, adjectives, and adverbs, in a text relative to the total number of words. The higher the lexical density value, the richer the information content in a text, while a lower value may suggest the presence of more function words, such as prepositions, conjunctions, and articles, indicating a more conversational style.

Table 1

Results of the independent samples t- test at pre- and post-training lexical density

Time	Control group			Experimental group							95% CI:	
	N	Mean	SD	N	Mean	SD	T	Df	P	D	Lower	Upper
Pre	45	.44	.08	45	.44	.09	-.06	88	.95	0.1	-.03	.03
Post	41	.38	.07	45	.57	.07	-12	84	.000	.38	-.22	-.16

As Table 1 indicates, an independent samples t-test was computed comparing the mean scores of control and experimental groups of students' lexical density in their written texts. There was no statistically significant difference between the two groups, t (88) = -.06, p = .95, mean difference = .001, 95% CI [- .037 to .035], with the magnitude of the effect size d = 0.1 being very small, while the control group (M = .448, SD = .08, n = 45) scored lower than the experimental group (M = .449, SD = .09, n = 45) on the lexical density in students' written texts. Therefore, there was no statistically significant difference between the two groups at pre-training.

Similarly, an independent samples t-test was performed comparing the mean scores of the control and experimental groups' lexical density in their written texts. There was a statistically significant difference between the two groups, t (84) = -12.59, p = .000, mean difference = -1.19, 95% CI [-.22, -.16]; the effect size (d = .38) was medium. The lexical density score of the control group (M = .38, SD = .07, n =41) was less dense than that of the experimental group (M = .57, SD = .07, n = 45). Therefore, there was a statistical difference between the control and treatment groups in terms of lexical density in their written texts after the treatment.

Table 2

Pre and post-treatment results of lexical density for the control and experimental groups

Time	Pre-training			Post- training								95% CI:	
	N	Mean	SD	N	Mean	SD	Df	T	P	R	lower	Upper	
pre	41	.60	.13	41	.38	.07	40	8.99	.000	-.06	.17	.27	
Post	45	.448	.09	45	.59	.07	44	-7.8	.000	-.19	-.18	-.1	

Table 2 portrayed that the mean of lexical density before treatment (m= 0.6, SD = 0.13) and after the usual procedure was taking place (m = 0.38, SD = 0.07) at the 0.05 level of significance, t(40) = 8.99, n = 41, p = .000, 95% CI for the mean difference: 0.17 to 0.27, r = -0.06. On average, the lexical density in the students' written texts after treatment was about 0.22 points less than before the training. Therefore, the positive mean indicates there is no statistically significant difference between pre- and post-training, but the higher point at the pre-test was by chance. The results in Table 2 depicted that the mean scores of lexical density before treatment (m = .448, SD = .09) and after treatment (m = .59, SD = 0.07) at the 0.05 level of significance, t(88) = -7.8, n = 45, p = .000, 95% CI for the mean difference: 0.19 to 0.1. On average, the lexical density in the students' written texts after treatment was about -.14 points greater than

before the training. Therefore, it was concluded that there is a statistically significant difference between the lexical density of students' written texts before treatment and the lexical density after treatment. So, the alternative hypothesis will be accepted because the treatment employed was effective.

Results on Linguistic Quality

As revealed in Table 3, an independent-samples t-test conducted at the pre-test stage indicated that there was no statistically significant difference in linguistic quality between the experimental group (M = 7.50, SD = 2.20, n = 52) and the control group (M = 7.06, SD = 1.50, n = 47), t(90) = -1.10, p = .26, 95% CI [−1.10, 0.31], with the effect size d = 0.23 being small, suggesting that the two groups were similar in linguistic quality before the treatment.

Table 3

Results on linguistic quality of the independent samples t- test at pre- and post-training

Time	Control group			Experimental group			T	Df	P		95% CI:	
	N	Mean	SD	N	Mean	SD				D	Lower	Upper
Pre	47	7.06	1.5	52	7.5	2.2	-1.1	90	.26	0.2	-1.1	.31
Post	47	8.68	2.5	52	15	4.7	-8.2	97	.000	1.7	-7.9	-4.8

However, the post-test results depicted a statistically significant difference in linguistic quality between the experimental and control groups. Students in the experimental group (M = 15.00, SD = 4.70, n = 52) scored significantly higher than in the control group (M = 8.68, SD = 2.50, n = 47), t (97) = -8.20, p = .000, mean difference = -6.40, 95% CI [−7.90, -4.80]. The effect size was large (d = 1.66), indicating a considerable practical impact of the writing strategy training on students' linguistic quality.

Results from the Interview

Table 4 depicts the qualitative results derived from semi-structured interviews, summarizing key themes, sub-themes, and participants' statements. The table reflects how writing strategy training

influenced learners' qualities of vocabulary use, writing processes, and affective experiences.

As for the first theme, 'enhanced vocabulary and awareness', the ability to use precise words (F = 7) and confidence in using new vocabulary (F = 6) reported that strategy training helped the students select more appropriate and diverse vocabulary rather than repeating simple words. This confirms increased awareness of lexical choice, and the intervention effectively strengthened their lexical decision-making.

Likewise, the theme 'Improved Writing Quality through Strategic Behavior' highlights gains in organization and coherence (F = 8) and attention to grammar and structure (F = 7). It is noted that planning, revising, and monitoring techniques made their writing clearer and more logically arranged.

Table 4

Theme, Frequencies, and Sample Student Responses from the Interview

Theme	Sub-theme	F	Student response
Enhanced vocabulary and awareness	Ability to use precise words	7	I now choose better words instead of repeating
	Confidence using new vocabulary	6	Planning helps my ideas flow clearly.
Improved writing quality through strategic behavior	Better organization and coherence	8	I revise and correct grammar before finishing.
	Attention to grammar and structure	7	I do not fear now because I know the steps.
Increased motivation and reduced writing difficulty	Reduced fear and anxiety	5	Writing feels easier and more enjoyable now.
	Writing becomes easier and more enjoyable.	6	-

The responses "I revise and correct grammar before finishing" show that learners adopted metacognitive and cognitive strategies to apply them.

The last theme, 'Increased Motivation and Reduced Writing Difficulty,' involves reduced fear and anxiety (F = 5) and writing becoming easier and enjoyable (F = 6), indicating reduced writing fear, enhanced confidence, and better enjoyment in writing. The comment, "Writing feels easier and more enjoyable now," indicates that strategy training positively influenced learners' affective states, reducing writing worry and enhancing commitment.

Generally, the qualitative results support the quantitative findings, indicating that strategy training not only improved lexical density and linguistic quality but also changed learners' attitudes, confidence, and strategic engagement in writing. The common sense of these outcomes supports the effectiveness of the intervention.

DISCUSSION

Effect of Writing Strategy Training on Lexical Density

The findings showed there was a statistically significant improvement in the lexical density of students' written text in the experimental group, whereas the control group gained no meaningful output. Prior to the intervention, both groups demonstrated similar lexical density results, indicating a similar base of achievement. After the intervention, however, the experimental group produced a paragraph with greater content words. The results suggest the density of information, developed vocabulary selection, and more advanced languages.

The findings match the previous studies, which show that the strategy training-based learning improves students' lexical richness and linguistic complexity (Namaziandost et al., 2022; Tömen & Köse, 2023). The interview responses supported the findings that the vocabulary, planning strategies, and revision-focused activities helped the learners replace repetitive words with more precise ones. Ayadi (2025) & Al-Shaer (2022) stated that the qualitative insights confirm that the improvement in lexical density was not accidental but resulted from learners' increased awareness of lexical use and strategic decision-making during writing (Ayadi, 2025; Al-Shaer, 2022). Hence, both sets of data support that strategy training significantly reinforces the lexical richness of EFL learners' written output.

Effect of Writing Strategy Training on Overall Linguistic Quality

The study also found substantial improvements in students' linguistic quality in vocabulary range,

grammatical accuracy, mechanics, sentence structure, and overall clarity in the case of the experimental group. While the control group maintained similar patterns of grammatical errors and limited sentence variation, the trained students portrayed marked progress in organization, language accuracy, and sentence complexity. These changes suggest that writing strategy training empowers learners in writing. This result is consistent with research showing that strategic instruction improves metacognitive control and results in stronger linguistic performance (Teng, 2022; Rahimi & Zhang, 2023). The qualitative data further verified these quantitative improvements in that the interviewees emphasized the strategies, such as cognitive (outlining), social (peer collaboration), and metacognitive (planning for checking mechanics), which helped them produce clearer and more coherent texts. Such reflections go with findings from Chen (2022), which confirms that strategy training expands students' ability to guide grammar and sentence structure. Therefore, the joint of quantitative and qualitative findings supports the decision that writing strategy training significantly enhances linguistic quality in EFL learners' writing.

The Effects of Students' Writing Perceptions on Vocabulary Use and Writing Quality

The results from the interview showed that students had positive outlooks for writing, particularly how it improved their vocabulary selection and writing quality. A number of students suggested that the training assisted them in generating vocabulary much more confidently, choosing clearer words, avoiding repetition, and revising their writing more carefully. They qualified these changes to learning cognitive strategies (grouping, using synonyms, antonyms, and imagining words), metacognitive strategies (planning and checking), and social strategies (peer discussion). The results also back up the quantitative findings that students performed better in writing and understood why their writing ability improved. This aligns with the findings of the studies by Dinsa (2023) and Alemu and

Gebremariam (2025), which reveal that learners perceive strategy-based instruction as empowering, motivating, and effective in improving both fluency and linguistic sophistication. Students in this study understood that the strategy training reduced writing fear, helped them organize ideas, and made them confident in vocabulary choice. In support of these, Teng and Zhang (2021) found that strategy training improves self-efficacy and vocabulary application. Overall, students' reflections on writing intensely supported the quantitative findings, confirming that strategy training is both influential and well-received by learners.

CONCLUSIONS

This study examined the impact of writing strategy training on Grade 11 EFL students' lexical density, linguistic quality, and their perceptions of paragraph writing. The findings precisely showed that strategy training significantly enhanced students' writing performance at a thorough linguistic level. The experimental group showed substantial improvement in lexical density, indicating denser vocabulary use in writing. Similarly, tangible gains in linguistic quality entail improved grammar, clear organization, and more coherent sentence structure. These quantitative results were reinforced by qualitative insights as strategy training helped them plan, generate vocabulary, monitor their writing plan, revise effectively, and write with greater confidence. Both findings confirm that writing strategy training is not simply an additional technique but a powerful pedagogical approach that meaningfully changes learners' writing behaviors and output.

To sum up, the study highlights the importance of adopting writing strategy training in secondary EFL writing classrooms. Training explicitly leads to well-planned, monitored, and revised writing. In addition, the students developed stronger control over language, greater awareness of vocabulary range, and improved confidence. Therefore, integrating cognitive, metacognitive, memory, compensation, and social strategies into regular writing lessons is important

for enhancing more capable and communicative writers. The results also indicate the need for schools and teachers to prioritize ongoing professional development so that strategy training becomes a reliable and supportable part of English writing pedagogy.

Recommendations

Based on the findings, it is recommended that high school EFL teachers implement writing strategy training as a regular part of writing instruction, focusing on cognitive, metacognitive, memory, and compensatory strategies. Curriculum designers and policymakers should include strategy-based writing instruction in national syllabi and teacher training programs to foster students' lexical density and linguistic quality. Then, schools are invigorated to provide continuous professional development, empowering teachers to implement strategy training effectively. Finally, future research may replicate the study across different grade levels, larger samples, and varied writing types to reinforce generalizability and explore the long-term effects of strategy instruction on students' linguistic improvement.

CRediT Authorship Contribution Statement

Lalisa Leta: Investigation, Data curation, Formal analysis, and Writing - Original Draft. **Tekle Ferede:** Validation, Supervision, **Teshale Tefera**: Writing - Review & Editing, Project administration

Declaration of Competing Interest

There was no conflict of interest among the authors.

Ethical Approval

The data were collected based on the permission of the school administration and the consent of all participants.

Data Availability Statement

Upon reasonable request, the corresponding author will provide the data produced during the current study.

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